Cascades Volcano Observatory
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Professional Research and Teaching Experience

2008–Present U.S. Geological Survey, Cascades Volcano Observatory
- · Mendenhall Postdoctoral Fellow
- · Research Mathematician
- · Researching models and numerical methods in computational geophysics

2007–2008 University of Washington, Department of Applied Mathematics
- · NSF-VIGRE Postdoctoral Fellow
- · Research Associate and Assistant Professor
- · Instructor: Applied and Numerical Linear Algebra, Applied Partial Differential Equations

2006-2007 University of Utah, Department of Mathematics
- · NSF-RTG Postdoctoral Fellow
- · Research Associate and Assistant Professor
- · Instructor: Partial Differential Equations for Engineers, Calculus III

Education

- Ph.D. Applied Mathematics, University of Washington, Seattle, 2006
  - · Thesis: *Finite Volume Methods and Adaptive Refinement for Tsunami Propagation and Inundation*
  - · Advisor: Randall LeVeque
- M.S. Applied Mathematics, University of Washington, Seattle, 2004
  - · Thesis: *Numerical Approximation of the Nonlinear Shallow Water Equations with Topography and Dry-States: A Godunov-Type Scheme*
- B.A. Physics, *High Honors*, University of California at Santa Barbara, 1999
- B.S. Biological Sciences, *High Honors*, University of California at Santa Barbara, 1999
- B.A. Anthropology, *High Honors*, University of California at Santa Barbara, 1997

Research Interests

My research interests are in applied and computational mathematics, numerical analysis and PDEs, for scientific computation. In particular, I study adaptive finite volume methods for hyperbolic conservation laws and related wave-propagation problems in geophysics involving shallow free-surface flows. I develop methods and software for those applications.

Publications

- Adaptive Mesh Refinement Techniques for Tsunamis and Other Geophysical Flows Over Topography. M. J. Berger, D. L. George and R. J. LeVeque. In preparation, 2009.
- Simulation of Tsunami for Risk Mitigation: A Vancouver Island Case Study. D. A. Alexander, D. L. George, R. J. LeVeque, W. Johnstone. In preparation, 2009.
- Adaptive Finite Volume Methods with Well-Balanced Riemann Solvers for Modeling Floods in Rugged Terrain: application to the Malpasset dam-break flood (France, 1959). D. L. George, *Int. J. Numer. Methods Fluids*, to appear, 2009.
- Augmented Riemann Solvers for the Shallow Water Equations over Variable Topography with Steady States and Inundation. D. L. George, *J. Comput. Phys.*, 227(6):3089-3113, March 2008.
- High-Resolution Finite Volume Methods for the Shallow Water Equations with Topography and Dry-States. R.J. LeVeque and D. L. George. In P. L. Liu, C. Synolakis, and H. Yeh, editors, *Advanced Numerical Models for Simulating Tsunami Waves and Runup,* volume 10 of *Advances in Coastal and Ocean Engineering*, pages 43-73. World Scientific, 2008.
- High-Resolution Methods and Adaptive Refinement for Tsunami Propagation and Inundation. D. L. George and R. J. LeVeque. In S. Benzoni-Gavage and D. Serre, editors, *Hyperbolic Problems: Theory, Numerics, Applications*, pages 541-549, Springer 2008. Proc. 11th Intl. Conf. on Hyperbolic Problems, Lyon France, July 2006.
- Finite Volume Methods and Adaptive Refinement for Global Tsunami Propagation and Inundation. D. L. George and R. J. LeVeque. *Science of Tsunami Hazards*, Vol. 24. No. 5, 319-328, 2006.

Professional Membership and Service

- Member and Participant in Mathematical Societies: AMS, MAA and SIAM, 2002–Present.
- Member and Participant in Geological Societies: AGU, GSA, 2005–Present.
- Active Participant in the Inundation and Engineering Cooperative (ISEC), `http://isec.nacse.org`
- Collaborator with the Arctic Regional Supercomputing Center's Tsunami Portal Project.
- Journal reviewer for *J. Comput. Phys., J. Fluid Mech., Int. J. Numer. Meth. Fluids, J. Eng. Mech., AIMS, J. Comp. Methods Appl. Mech.& Eng., J. Hydraul. Eng., J. Water Res.*
- Grant proposal reviewer for Chilean Superior Council of the National Fund for Scientific & Technological Development (FONDECYT).
- Participant in field experiments at the USGS Debris Flow Flume, and OSU Wave Research Lab.

Awards and Honors

- Mendenhall Postdoctoral Fellowship, U.S. Geological Survey, 2008
- NSF-VIGRE Postdoctoral Fellowship, University of Washington, 2007
- SIAM-NSF Early Career Travel Award, 2007
- NSF-RTG Postdoctoral Fellowship, University of Utah, 2006
- Supported by NSF grant: *Tsunamis in 3-D Bathymetry*, 2003-2006
- Boeing Award for Excellence, University of Washington, 2003

Talks and Workshop Participation

- *ISEC Community Workshop: Simulation and Large-scale Testing of Nearshore Wave Dynamics*, NEES Tsunami Research Facility, Oregon State University, July 2009. Invited participant and speaker for multiple sessions.
- *Debris Flow Workshop*, University of Washington, Seattle, March 2009. Invited talk: "Computation of Large-Scale Geophysical Flows."
- *SIAM Conference on Computational Science and Engineering*, Miami, March 2009. Invited talk: "Adaptive Mesh Refinement for Tsunami Modeling."
- *AMS/MAA Joint Annual Meeting*, Washington DC, January 2009. Invited talk: "Software and Methods for Hazardous Free-Surface Geophysical Flows."
- *SIAM Annual Meeting*, San Diego, CA, July 2008. Contributed Talk "Generalizing Methods for the Shallow Water Equations to Debris Flow Models." Session Organizer: "Advances in Computation of Avalanches, Debris Flows, and Floods."
- *AGU Fall Annual Meeting*, San Francisco, CA, December 2007. U51A-0014: "Modeling Indian Ocean Tsunami Propagation and Inundation with TsunamiClaw—Adaptive Finite Volume Methods."
- *SIAM Conference on Mathematical and Computational Issues in the Geosciences*, Santa Fe, NM, March 2007. Contributed Talk: "Wave Propagation Algorithms and Adaptive Refinement for Tsunami Modeling." Session Chair: "Ocean Modeling."
- *SIAM Conference on Computational Science and Engineering*, Costa Mesa, CA, February 2007. Special Session on Wave Propagation Algorithms. Invited Talk: "Adaptive Refinement for Tsunami Modeling."
- *Eleventh International Conference on Hyperbolic Problems, Theory, Numerics, Applications.* École Normale Supérieure de Lyon, Lyon, France, July 2006. Contributed Talk: "High-Resolution Methods and Adaptive Refinement for Tsunami Propagation and Inundation."
- *Third Tsunami Symposium of the Tsunami Society.* University of Hawaii, Honolulu, May 2006. Invited Talk: "Numerical Modeling: Finite Volume Methods and Adaptive Refinement for Global Propagation and Local Inundation."
- *Simon Frasier University, Department of Mathematics and Statistics.* Vancouver, BC, January 2006. Invited Talk: "Finite Volume Methods and Adaptive Mesh Refinement for Tsunami Modeling."
- *Pacific Northwest Numerical Analysis Annual Seminar* (PNWNAS). Western Washington University, October 2005. Invited Talk: "Tsunami Modeling."
- *SIAM Annual Meeting.* New Orleans, July 2005. Invited Talk: "Finite Volume Methods for Tsunami Modeling," *R. J. LeVeque* and D. L. George.
- *NSF Workshop on Tsunami Deposits and Their Role in Hazard Mitigation.* University of Washington, June 2005. Invited Participant.
- *University of Victoria, Department of Mathematics and Statistics.* Victoria, BC, November 2004. Invited Talk: "A Wave-Propagation Method for the Shallow Water Equations."
- *SIAM Annual Meeting.* Portland, OR, July 2004. Contributed Talk: "A High-Resolution Method for the Shallow Water Equations: Capturing Moving Shorelines over Topography."
- *Workshop on Free Surface Water Waves.* The Fields Institute for Mathematical Research, Toronto, June 2004. Invited Participant.
- *Short-Course on Hyperbolic Conservation Laws.* Isaac Newton Institute for Mathematical Sciences, Cambridge University, April 2003. Invited Participant.